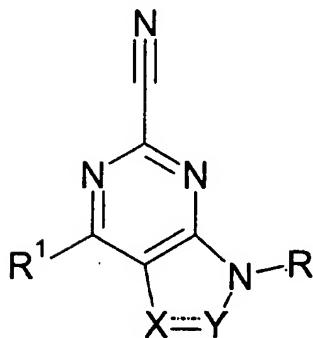


## CLAIMS

1. A compound of formula (I):

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10 (I)

in which:

X is N, NH, :CH or CH<sub>2</sub>;

Y is N, :CH, CO, CH<sub>2</sub> or :CNR<sup>2</sup>R<sup>3</sup>, where R<sup>2</sup> and R<sup>3</sup> are independently hydrogen, C<sub>1-6</sub> alkyl or C<sub>3-6</sub> cycloalkyl;

R is aryl or heteroaryl optionally substituted by halogen, amino, hydroxy, cyano, nitro, trifluoromethyl, carboxy, CONR<sup>5</sup>R<sup>6</sup>, SO<sub>2</sub>NR<sup>5</sup>R<sup>6</sup>, SO<sub>2</sub>R<sup>4</sup>, NHSO<sub>2</sub>R<sup>4</sup>, NHCOR<sup>4</sup>, ethylenedioxy, methylenedioxy, C<sub>1-6</sub> alkyl, C<sub>1-6</sub> alkoxy, SR<sup>4</sup> or NR<sup>5</sup>R<sup>6</sup> where R<sup>4</sup> is hydrogen, C<sub>1-6</sub> alkyl or C<sub>3-6</sub> cycloalkyl, R<sup>5</sup> and R<sup>6</sup> are independently hydrogen, C<sub>1-6</sub> alkyl or together with the nitrogen atom to which they are attached form a 5- or 6-membered saturated ring optionally containing a further O, S or NR<sup>4</sup> group; or R is hydrogen, C<sub>1-6</sub> alkyl or C<sub>3-6</sub> cycloalkyl both of which can optionally contain one or more O, S or NR<sup>4</sup> groups,

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R<sup>1</sup> is a group Y(CH<sub>2</sub>)<sup>p</sup>R<sup>7</sup> where p is 0, 1 or 2 and Y is O or NR<sup>8</sup> where R<sup>8</sup> is hydrogen, C<sub>1-6</sub> alkyl or C<sub>3-6</sub> cycloalkyl; and R<sup>7</sup> is a 5- or 6-membered saturated ring containing one or more O, S or N atoms, aryl or a heteroaryl group containing one to four heteroatoms selected from O, S or N, the saturated ring, aryl and heteroaryl groups all being optionally substituted by halogen,

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amino, hydroxy, cyano, nitro, trifluoromethyl, carboxy, CONR<sup>5</sup>R<sup>6</sup>, SO<sub>2</sub>NR<sup>5</sup>R<sup>6</sup>, SO<sub>2</sub>R<sup>4</sup>, NHSO<sub>2</sub>R<sup>4</sup>, NHCOR<sup>4</sup>, C<sub>1-6</sub> alkyl, C<sub>1-6</sub> alkoxy, SR<sup>4</sup> or NR<sup>5</sup>R<sup>6</sup> where R<sup>4</sup> is hydrogen, C<sub>1-6</sub> alkyl or C<sub>3-6</sub> cycloalkyl, R<sup>5</sup> and R<sup>6</sup> are independently hydrogen, C<sub>1-6</sub> alkyl or together with the nitrogen atom to which they are attached form a 5- or 6-membered saturated ring

5    optionally containing a further O, S or NR<sup>4</sup> group;

or R<sup>1</sup> is a group NR<sup>9</sup>R<sup>10</sup> where R<sup>9</sup> and R<sup>10</sup> are independently hydrogen or C<sub>1-6</sub> alkyl

optionally containing one or more O, S or NR<sup>4</sup> groups, or R<sup>9</sup> and R<sup>10</sup> together with the

nitrogen atom to which they are attached form a 5 or 6-membered saturated ring optionally

10    containing a further O, S or N atom and optionally substituted by NR<sup>9</sup>R<sup>10</sup>, CO<sub>2</sub>C<sub>1-6</sub> alkyl,

CONR<sup>11</sup>R<sup>12</sup> where R<sup>11</sup> and R<sup>12</sup> are independently hydrogen or C<sub>1-6</sub> alkyl, aryl or heteroaryl

group optionally substituted by halogen, amino, hydroxy, cyano, nitro, trifluoromethyl,

carboxy, CONR<sup>5</sup>R<sup>6</sup>, SO<sub>2</sub>NR<sup>5</sup>R<sup>6</sup>, SO<sub>2</sub>R<sup>4</sup>, NHSO<sub>2</sub>R<sup>4</sup>, NHCOR<sup>4</sup>, C<sub>1-6</sub> alkyl, C<sub>1-6</sub> alkoxy, SR<sup>4</sup>

15    or NR<sup>5</sup>R<sup>6</sup> where R<sup>4</sup> is hydrogen, C<sub>1-6</sub> alkyl or C<sub>3-6</sub> cycloalkyl, R<sup>5</sup> and R<sup>6</sup> are independently

hydrogen, C<sub>1-6</sub> alkyl or together with the nitrogen atom to which they are attached form a

5- or 6-membered saturated ring optionally containing a further O, S or NR<sup>4</sup> group;

and pharmaceutically acceptable salts or solvates thereof.

2. A compound according to claim 1 in which X is N and Y is :CH, X and Y are :CH or X

20    and Y are CH<sub>2</sub>

3. A compound according to claim 1 or 2 in which R is C<sub>1-4</sub>alkyl, or phenyl substituted

by halogen, SO<sub>2</sub>Me, C<sub>1-6</sub>alkoxy or C<sub>1-4</sub>alkyl.

25    4. A compound according to any one of claims 1 to 3 in which R<sup>1</sup> is a group Y(CH<sub>2</sub>)<sub>p</sub>R<sup>7</sup>

where p is 0 and Y is NR<sup>8</sup> where R<sup>8</sup> is hydrogen and R<sup>7</sup> is substituted phenyl.

5. A compound according to any one of claims 1 to 3 in which R<sup>1</sup> is NR<sup>9</sup>R<sup>10</sup> where R<sup>9</sup>

and R<sup>10</sup> are hydrogen or C<sub>1-3</sub> alkyl or together with the nitrogen atom to which they are

30    attached form a 5 or 6-membered saturated ring optionally containing a O, S or NR<sup>4</sup>.

6. A compound of formula (I) selected from:

1-[9-(4-Chlorophenyl)-2-cyano-9H-purin-6-yl]-L-prolinamide,

9-(4-Chlorophenyl)-6-(4-pyrrolidin-1-ylpiperidin-1-yl)-9H-purine-2-carbonitrile,

35    9-(4-Chlorophenyl)-6-[(3-pyrrolidin-1-ylpropyl)amino]-9H-purine-2-carbonitrile,

6-(4-Aminopiperidin-1-yl)-9-(4-chlorophenyl)-9H-purine-2-carbonitrile,

6-[(2-Aminoethyl)amino]-9-(4-chlorophenyl)-9H-purine-2-carbonitrile,  
9-(4-Chlorophenyl)-6-(dimethylamino)-9H-purine-2-carbonitrile,  
9-(4-Methylphenyl)-6-pyrrolidin-1-yl-9H-purine-2-carbonitrile,  
9-(4-Methoxyphenyl)-6-pyrrolidin-1-yl-9H-purine-2-carbonitrile,  
5 9-(4-chlorophenyl)-6-pyrrolidin-1-yl-9H-purine-2-carbonitrile,  
9-(4-Chlorophenyl)-6-(ethylamino)-9H-purine-2-carbonitrile,  
tert-Butyl 4-[9-(4-chlorophenyl)-2-cyano-9H-purin-6-yl]piperazine-1-carboxylate,  
9-(4-Chlorophenyl)-6-piperazin-1-yl-9H-purine-2-carbonitrile,  
9-(2-Chlorophenyl)-6-morpholin-4-yl-9H-purine-2-carbonitrile  
10 9-(3,4-Difluorophenyl)-6-morpholin-4-yl-9H-purine-2-carbonitrile,  
9-(4-Isopropylphenyl)-6-morpholin-4-yl-9H-purine-2-carbonitrile,  
9-(4-Methoxyphenyl)-6-morpholin-4-yl-9H-purine-2-carbonitrile,  
9-(3-Chlorophenyl)-6-morpholin-4-yl-9H-purine-2-carbonitrile,  
9-[4-(Methylsulfonyl)phenyl]-6-morpholin-4-yl-9H-purine-2-carbonitrile,  
15 6-[(4-Chlorophenyl)amino]-9-ethyl-9H-purine-2-carbonitrile,  
9-(4-Chlorophenyl)-6-morpholin-4-yl-9H-purine-2-carbonitrile,  
8-Amino-6-[(4-chlorophenyl)amino]-9-ethyl-9H-purine-2-carbonitrile,  
8-Amino-9-(4-chlorophenyl)-6-morpholin-4-yl-9H-purine-2-carbonitrile,  
9-(4-Chlorophenyl)-6-morpholin-4-yl-8-oxo-8,9-dihydro-7H-purine-2-carbonitrile,  
20 9-(4-Chlorophenyl)-8-(dimethylamino)-6-morpholin-4-yl-9H-purine-2-carbonitrile,  
7-(4-Chlorophenyl)-4-morpholin-4-yl-7H-pyrrolo[2,3-d]pyrimidine-2-carbonitrile,  
7-(4-Chlorophenyl)-4-(ethylamino)-7H-pyrrolo[2,3-d]pyrimidine-2-carbonitrile,  
4-[(4-Chlorophenyl)amino]-7-ethyl-7H-pyrrolo[2,3-d]pyrimidine-2-carbonitrile,  
1-[7-(4-Chlorophenyl)-2-cyano-6,7-dihydro-5H-pyrrolo[2,3-d]pyrimidin-4-yl]-L-  
25 prolinamide,  
1-[2-Cyano-7-(4-methoxyphenyl)-6,7-dihydro-5H-pyrrolo[2,3-d]pyrimidin-4-yl]-L-  
prolinamide,  
7-(4-Methoxyphenyl)-4-pyrrolidin-1-yl-6,7-dihydro-5H-pyrrolo[2,3-d]pyrimidine-2-  
carbonitrile,  
30 7-(4-Methoxyphenyl)-4-morpholin-4-yl-6,7-dihydro-5H-pyrrolo[2,3-d]pyrimidine-2-  
carbonitrile,  
1-(4-Methylphenyl)-4-morpholin-4-yl-1H-pyrazolo[3,4-d]pyrimidine-6-carbonitrile,  
and pharmaceutically acceptable salts thereof.  
35 7. A compound of formula (I) as defined in any one of claims 1 to 6 for use in therapy.

8. A compound of formula (I) as defined in any one of claims 1 to 6 for use in the treatment of pain.

9. A compound of formula (I) as defined in any one of claims 1 to 6 for use in the treatment of neuropathic pain.

10. A pharmaceutical composition which comprises a compound of the formula (I) as defined in any one of claims 1 to 6 or a pharmaceutically acceptable salt thereof and a pharmaceutically acceptable diluent or carrier.

11. A method for producing inhibition of a cysteine protease in a mammal, such as man, in need of such treatment, which comprises administering to said mammal an effective amount of a compound as defined in any one of claims 1 to 6, or a pharmaceutically acceptable salt thereof.

12. A method for treating pain, such as neuropathic pain, in a mammal, such as man, in need of such treatment, which comprises administering to said mammal an effective amount of a compound as defined in any one of claims 1 to 6, or a pharmaceutically acceptable salt thereof.

13. Use of a compound of the formula (I) as defined in any one of claims 1 to 6 or a pharmaceutically acceptable salt thereof, in the manufacture of a medicament for use in the inhibition of Cathepsin S in a warm blooded animal, such as man.